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GRC Environmental Programs Manual—Chapter 14

Oil Filled Equipment

Approved by: Energy and Environmental Management Office Chief

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Change Record

Revision	Effective Date	Expiration Date	C-25, Change Request #	Description
A	4/2015	4/2020		Updated all form links to reflect the NASA Electronic Form portal. Corrected several form names.

***Include all information for each revision. Do not remove old revision data. Add new rows to table when space runs out by pressing the tab key in the last row, far right column.*

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Chapter 14.—Oil-Filled Equipment

***NOTE:** This chapter is maintained and approved by the Energy and Environmental Management Office (EEMO). The last revision date of this chapter was March 2015. The current version is maintained on the Glenn Research Center internet at <http://www.grc.nasa.gov/WWW/FTD/EEMO/index.html>. Approved by: Chief of Energy and Environmental Management Office.*

1.0 PURPOSE

This chapter establishes programmatic requirements for the inspection and regulatory compliance of oil-filled equipment. The policies and procedures outlined in this chapter will help reduce spills, leaks, and releases from oil-filled equipment that could potentially enter waterways and soils.

2.0 APPLICABILITY

This chapter applies to all personnel at NASA Glenn Research Center (GRC) who utilize or maintain oil-filled equipment with capacities of 55 gallons or more. This chapter encompasses oil-filled electrical, operating, and manufacturing equipment, but excludes bulk storage containers. Examples of oil-filled equipment include, but are not limited to, elevator reservoirs, oil-filled transformers, lubricating systems (for compressors, pumps, and other rotating equipment), gear boxes, heat transfer systems, machining coolant systems, and oil-filled circuit breakers.

3.0 BACKGROUND

Originally published in 1973 under the authority of Section 311 of the Clean Water Act, the Oil Pollution Prevention regulations set forth requirements for prevention of, preparedness for, and response to oil discharges at specific non-transportation-related facilities. To prevent oil from reaching navigable waters and adjoining shorelines, and to contain discharges of oil, the regulation requires these facilities to develop Spill Pollution Control & Countermeasure (SPCC) plans. Such facilities must establish procedures, methods, and equipment requirements for both preventing and cleaning up oil discharges.

4.0 POLICY

It is GRC policy to follow the requirements and recommendations of all relevant Federal, state, and local regulations applicable to oil-filled equipment. The complete regulatory texts should be consulted for further details. The following are authorities that presently regulate oil-filled equipment at GRC and are incorporated by reference:

1. 29 Code of Federal Regulations (CFR) 1910.106, Flammable and Combustible Liquid Standard
 - a. The Occupational Safety and Health Administration (OSHA) enacted regulations applicable to flammable and combustible liquids used in the workplace. These regulations specify the special precautions that shall be taken to ensure that flammable and combustible liquids are handled and stored safely.
2. 40 CFR 112, Oil Pollution Prevention
 - a. This regulation is applicable to oil-filled equipment with capacities of 55 gallons or greater.
 - b. Facilities subject to this rule must prepare and implement a plan to prevent any discharge of oil into or upon navigable waters of the United States or adjoining shorelines.
 - c. This rule provides the policies and procedures to prevent, control, and administer countermeasures to oil spills.
3. 40 CFR 122, National Pollutant Discharge Elimination System
 - a. This regulation requires a permit for storm water runoff. It addresses pollution in precipitation runoff that is discharged from certain industrial sites, construction sites disturbing 1 acre or more, and urban storm sewers.
 - b. Regulations are applicable to any releases of contaminated rain water from secondary containment into navigable waters of the United States.

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4. National Fire Protection Association (NFPA) 30 and 30A
 - a. These codes apply to the storage, handling, and use of flammable and combustible liquids, including waste liquids.
5. Ohio Fire Code, Chapter 34
 - a. The Ohio Fire Code addresses prevention, control, and mitigation of dangerous conditions related to the storage, use, dispensing, mixing, and handling of flammable and combustible liquids.

5.0 RESPONSIBILITIES

5.1 All GRC Personnel

Any person who causes or discovers a spill at Lewis Field or Plum Brook Station (PBS) shall immediately notify emergency dispatch by calling 911 on a GRC in-house phone line. When using a cell phone, dial 216-433-8888 at Lewis Field or 419-621-3222 at PBS. For further guidance, refer to Lewis Field or PBS's Integrated Contingency Plan (ICP).

5.2 Aboveground Storage Tank (AST) Program Lead

At Lewis Field, the AST Program Lead inspects oil-filled equipment (see Appendix B) as part of the AST program to ensure that the equipment is in compliance with the Oil Pollution Prevention Act as well as with the provisions of the ICP. At PBS, the PBS Team shall perform this task.

5.3 Human Capital Development Branch Chief

The Human Capital Development Branch Chief is responsible for the maintenance of training records for SPCC and AST training modules on the System for Administration, Training and Educational Resources for NASA (SATERN) system. This includes trainings conducted both online and in person.

5.4 Spill Response Lead

At Lewis Field, the Spill Response Lead shall respond to liquid spills of any type once notified by Security Emergency Dispatch and shall ensure that proper clean-up methods are implemented. The Spill Response Lead is also responsible for creating and updating the SPCC plan and Chapter 8, Spill Control, in the Environmental Programs Manual at GRC. At PBS, the PBS Team shall perform these tasks.

5.5 Fuel Distribution Supervisor

The Fuel Distribution Supervisor shall ensure that employees involved in the receiving, transport, and transfer of oil and fuel at GRC receive annual Resource Conservation and Recovery Act (RCRA), SPCC, water pollution, AST, and Underground Storage Tank (UST) training. Employees shall comply with applicable provision of the ICPs at Lewis Field or PBS. At PBS, the onsite maintenance contractor handles oil and fuel receiving, transfer, and delivery.

5.6 Onsite Maintenance Contractors

Onsite maintenance contractors are responsible for the operation, maintenance, and monthly inspections of oil-filled equipment under their use and supervision at either Lewis Field or PBS per details outlined in the ICPs for each site.

6.0 REQUIREMENTS

6.1 Training (40 CFR 112.7 (f); GLM-QS-8500.1, Chapter 8)

All personnel who utilize, handle, store, or deliver petroleum-based products shall annually complete SPCC training through SATERN (course number GRC-006-08). At PBS, the SPCC training is a modified version of the SATERN Lewis Field module and is currently taught via an in-class presentation.

6.1.1 Employee completion of SPCC training is documented in SATERN, which is accessible by the reporting function of an administrative SATERN session.

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6.2 Maintenance Personnel or Operator Monthly Oil-Filled Equipment Inspections (40 CFR 112.8 (c)(6))

Maintenance personnel or operators of oil-filled equipment shall complete monthly inspections of their equipment to ensure equipment is not leaking. If leaks are discovered, they shall be promptly cleaned up, and repairs shall be made. Inspections shall be recorded on the Oil-filled Equipment Monthly Inspection form provided by SHeD and kept onsite. See Appendix B for an example of the form used at GRC.

6.2 Monthly oil-filled equipment inspection records are maintained by the maintenance personnel or operator onsite.

6.3 SHeD Annual Oil-Filled Equipment Inspections (40 CFR 112.8 (c)(6))

At Lewis Field, the AST Program Lead shall annually inspect oil-filled equipment to ensure that the equipment is in compliance with the Oil Pollution Prevention Act and that monthly inspection reports are completed by maintenance personnel or operators. The AST Program Lead shall also check to see that spills/leaks are being promptly handled and that spill kits are adequately stocked (see Appendix B). The PBS Team shall perform the annual inspections at PBS.

6.3 Annual oil-filled equipment inspection records are maintained by the AST Program Lead of the SHeD at Lewis Field and by the PBS Team at Plum Brook Station.

6.4 Contact List of Oil-Filled Equipment Maintenance Personnel and/or Operators

A list specifying the name of the maintenance personnel or operator and contact information for each piece of oil-filled equipment at Lewis Field shall be maintained and updated as needed by the AST Program Lead. At PBS, this list shall be maintained and updated by the PBS Team.

6.4 The contact list for oil-filled equipment maintenance personnel/operators is maintained by the AST Program Lead of the SHeD at Lewis Field and by the PBS Team at Plum Brook Station.

6.5 General Secondary Containment (40 CFR 112.7 (c))

Appropriate containment and/or diversionary structures shall be provided for oil-filled equipment with a storage capacity of 55 gallons or greater. The entire containment system, including walls and floor, must be capable of capturing oil and preventing it from discharging to the environment. When determining the size of secondary containment needed for the oil-filled equipment, you need only to address the volume of the largest piece of equipment in the containment area; 100 percent of this volume shall be contained. If the oil-filled equipment is located outdoors, the secondary containment shall accommodate 110 percent of the volume of the largest piece of equipment to account for precipitation.

6.5.1 Manual Drainage of Secondary Containment (40 CFR 112.8 (b))

For oil-filled equipment with a storage capacity of 55 gallons and up, if exposed to precipitation, containment shall be drained on a frequent basis to maintain the required containment capacity. The tank maintenance personnel or operator shall notify SHeD before releasing accumulated water from secondary containment. SHeD shall inspect the accumulated water and grant approval to empty the secondary containment of all oil-filled equipment susceptible to rain and snow accumulation. SHeD shall document the inspection and approval. No GRC personnel shall discharge water accumulation from a secondary containment without first receiving SHeD approval.

6.5.1 Records for manual drainage of secondary containment are maintained by the AST Program Lead in the SHeD at Lewis Field and by the PBS Team at Plum Brook Station.

6.5.2 Alternatives to Secondary Containment (40 CFR 112.7 (k) (2))

If secondary containment for oil-filled equipment with a capacity of 55 gallons and up is not feasible or practicable, then (1) procedures shall be established and documented for a monitoring program to detect equipment failure and/or a

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discharge and (2) a written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged shall be developed. The maintenance personnel or operator of the oil-filled equipment shall prepare this detailed plan, and it shall be reviewed and approved by the AST Program Lead at Lewis Field or the PBS Team at Plum Brook Station. Approved plans will be incorporated into the respective Center's ICP.

6.6 Spill Kits (40 CFR 112)

A spill kit shall be located within the line of sight from the oil-filled equipment. The oil-filled equipment maintenance personnel/operator is responsible for supplying and replenishing these kits.

6.6 The presence of an adequately stocked spill kit will be verified by oil-filled equipment maintenance personnel/operators during monthly inspections. SHED personnel and the PBS Team will verify the presence of an adequately stocked spill kit during their annual inspections.

6.7 GRC Integrated Contingency Plan (ICP)

The GRC ICPs for Lewis Field and PBS shall outline procedures for handling unplanned oil releases or spills in order to minimize hazards to human health and the environment.

6.8 Fire Protection (NFPA 10: 6.3.1.1; NFPA 30; Ohio Fire Code)

A fire extinguisher with a minimum of a 40-B rating shall be placed in a clearly marked location no greater than 30 ft away from the oil-filled equipment.

6.8 The presence of a fire extinguisher will be verified during monthly inspections by the oil-filled equipment maintenance personnel or operator. SHED personnel and the PBS Team will verify the presence of a properly rated fire extinguisher during their annual inspections.

6.9 Oil-Filled Equipment Signage (29 CFR 1910.1200; Ohio Fire Code 2007)

All oil-filled equipment with a capacity of 55 gallons and greater shall be properly labeled with the name of the contents (i.e., lube oil), the appropriate NFPA label based on contents, and a unique identification number (designated by the AST Program Lead for Lewis Field or the PBS Team at Plum Brook Station). Emergency contact information shall be posted onsite.

6.9 Proper signage on oil-filled equipment will be verified by SHED personnel and the PBS Team during annual inspections.

7.0 RECORDS

- Completed annual sets of monthly oil-filled equipment inspection forms.—Maintained by the equipment maintenance personnel/operator (see Appendix B).
- SHED annual oil-filled equipment inspection/audit forms.—Maintained by the AST Program Lead at Lewis Field and the PBS Team at Plum Brook Station (see Appendix B).
- Oil-filled equipment maintenance personnel/operator contact list.—Maintained by the AST Program Lead at Lewis Field and the PBS Team at Plum Brook Station.
- Training records.—Maintained by the Human Capital Development Branch. (In the case of a Support Service Contractor, these records could be maintained by the employer.)

8.0 REFERENCES

Document number	Document Name
29 CFR 1910.106	OSHA Flammable & Combustible Liquid Standard

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40 CFR 112	Oil Pollution Prevention
40 CFR 122	National Pollutant Discharge Elimination System (NPDES), Storm Water Permit Regulations
2007 Ohio Fire Code, OAC 1301: 7-7-34	Flammable and Combustible Liquids
NFPA 10	Standard for Portable Fire Extinguishers
NFPA Codes 30 and 30A	Flammable and Combustible Liquids; Code for Motor Fuel Dispensing Facilities, Repair Garages, and Aircraft Refueling
GLM-FE-8500.1-8	NASA Glenn Environmental Programs Manual, Chapter 8 , Spill Control
GLM-FE-8500.1-17	NASA Glenn Environmental Programs Manual, Chapter 17 , Chemical Hygiene Policy
GLM-FE-8500.1-25	NASA Glenn Environmental Programs Manual, Chapter 25 , Aboveground Storage Tanks
Lewis Field ICP	
Plum Brook Station ICP	

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APPENDIX A.—DEFINITIONS AND ACRONYMS

Aboveground Storage Tank (AST)

Bulk storage container.—Any container used to store oil with a capacity of 55 gallons or greater.

Code of Federal Regulations (CFR)

Combustible liquid.—A liquid having a cup flashpoint at or above 100 °F and subdivided into three categories:

- Class II, liquids having a closed-cup flashpoint at or above 100 °F and below 140 °F
- Class IIIA, liquids having a closed-cup flashpoint at or above 140 °F and below 200 °F
- Class IIIB, liquids having a closed-cup flashpoint at or above 200 °F

Emergency Planning and Community Right-to-Know Act (EPCRA)

Flammable liquid.—A liquid having a closed-cup flashpoint below 100 °F, and subdivided further into three categories:

- Class IA, liquids having a flashpoint below 73 °F and a boiling point below 100 °F
- Class IB, liquids having a flashpoint below 73 °F and a boiling point at or above 100 °F
- Class IC, liquids having a flashpoint at or above 73 °F and a boiling point below 100 °F

Glenn Research Center (GRC)

Integrated Contingency Plan (ICP).—A comprehensive plan that provides procedures for emergency preparedness and response allowing a facility to comply with various regulations. The objective of the plan is to minimize the threat to human health and the environment from incidents such as fires, explosions, unplanned oil releases/spills, and the release of hazardous chemicals into the air, soil, or water.

National Fire Protection Association (NFPA).—The mission of the NFPA is to reduce the worldwide crisis of fire and other hazards on the quality of life by providing and promoting codes and standards.

National Pollutant Discharge Elimination System (NPDES)

Ohio Administrative Code (OAC)

Oil.—Oil of any kind in any form, including but not limited to, fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil.

Oil-filled equipment.—Oil-filled electrical, operating, or manufacturing equipment, excluding bulk storage containers. Examples of oil-filled equipment includes, but is not limited to, elevator reservoirs, oil-filled transformers, lubricating systems (for compressors, pumps, and other rotating equipment), gear boxes, heat transfer systems, machining coolant systems, and oil-filled circuit breakers.

Resource Conservation and Recovery Act (RCRA)

Safety, Health and Environmental Division (SHED)

Secondary containment.—Dikes, containment curbs, pits, pallets with spill bladders, etc., designed to contain a spill or release of oil. Secondary containment should be designed to accommodate the capacity of the largest single container in an area.

System for Administration, Training and Educational Resources for NASA (SATERN)

Spill Prevention Control and Countermeasure (SPCC) plan.—A plan required by facilities subject to 40 CFR 112 to prevent any discharge of oil into or upon navigable waters of the United States. The SPCC is incorporated into the respective ICPs for Lewis Field and Plum Brook Station.

Underground Storage Tank (UST)

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APPENDIX B.—EXAMPLES OF FORMS

B.1 Example: SHeD Annual Oil-Filled Equipment Site Inspection Form

NASA Glenn Research Center

SHeD Oil-Filled Equipment Annual Inspection Form

Date of Inspection: _____ SHeD Inspector Name: _____

Date of Re-inspection: _____

Building No. and Description: _____ System: _____

Equipment ID/Location: _____ Contact: _____

Oil-Filled Equipment and Piping Related:	Yes	No	NA
1. NFPA Label, Unique ID, and Content Labeling exist and are appropriate for the product contained?			
2. Tank level gauge is present and is operating or reading tank levels correctly?			
3. The equipment is free of excessive corrosion, distortion, and dents or bulging?			
4. The equipment is free of signs of leaks, drips, or a potential for release?			
5. The associated piping is free of leaks, damage, wet fittings, bowing, or excessive corrosion?			
6. Access to the equipment is free of obstructions?			
Containment Related:	Yes	No	NA
7. Secondary containment is free of damage or breeches in the containment wall, berm, or curbing?			
8. Secondary containment drain valve is operational and kept in the closed position?			
9. Secondary containment is free of product, water, and/or debris?			
10. Secondary containment is free of equipment or containers that may reduce the size of the containment?			
11. Hazardous or incompatible chemical or product storage is not present in the same containment?			
Spill/Fire Response Related:	Yes	No	NA
12. Spill kit is in-line-of-sight of tank or drums and adequately stocked?			
13. Fire extinguisher is within 30 feet of site and in-line-of-sight or a sign is posted to its location?			
14. Emergency contact information is posted in the building and available to all personnel?			
Operator Related:	Yes	No	NA
15. Operator is completing monthly inspections properly and is keeping them onsite?			
16. Operator is addressing leaks, damage, or other noted concerns in a prompt manner?			

COMMENTS/FINDINGS:

FOLLOWUPS/UPDATES:

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B.2 Example of Oil-Filled Equipment Monthly Inspection Form

NASA Glenn Research Center

Oil-filled Equipment Monthly Inspection Form—Building XX

Equipment to be inspected:

● Transformer XXX

Attention Designated Inspector: Please answer YES (Y or ✓) or No (N or X) for the following questions and state corrective actions to be taken for those items marked with an N or X. Please add your initials in the last box with the corrective actions required. **Use reverse side of this form to notate observations/ corrective actions.**

Date	Spill kit present and stocked?	Fire extinguisher present?	Tank is free of leaks, corrosion, and bowing?	If applicable, is secondary containment free of damage?	Are there any leaks or drips visible from associated piping?	Identification labels and NFPA placards present?	Corrective actions required? Inspector initials

Please keep this document at the tank site at a designated area for collection by the Safety, Health and Environmental Division (SHeD)
Please contact SHeD at 3-6468 for questions regarding this document or the equipment being inspected.

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